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SURVIVAL, MOVEMENTS AND HABITAT USE OF APLOMADO FALCONS RELEASED IN SOUTHERN TEXAS

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ABSTRACT.—Aplomado falcons (*Falco femoralis*) formerly bred in Texas, New Mexico, and Arizona. Nesting in the U.S. was last documented in 1952. In 1986, aplomado falcons were listed as endangered and efforts to reestablish them in their former range were begun by releasing captive-reared individuals in southern Texas. From 1993–94, 38 hatch-year falcons were released on Laguna Atascosa National Wildlife Refuge. Two to 3 wk after release, 28 falcons were recaptured for attachment of tail-mounted radio-transmitters. We report on survival, movements, and habitat use of these birds. In 1993 and 1994, four and five mortalities occurred within 2 and 4 wk of release, respectively. From 2–6 mo post-release, 11 male and three female radio-tagged aplomado falcons used a home range of about 739 km^2 (range = 36–281 km^2). Most movements did not extend beyond 10 km from the refuge boundary, but a monitored male dispersed 136 km north when 70 d old. Average linear distance of daily movements was 34 ± 5 (SD) km. After falcons had been released 75 d, they consistently used specific areas to forage and roost. Woody plant density averaged 2.6 plants/ha on forage areas and 3.6 plants/ha at roost sites. Ground surface area was 60% vegetated in foraging areas and 46% vegetated at roost sites.

KEY WORDS: *Aplomado falcon*; Falco femoralis; *habitat use*, *mortality*, *movements*, *radio telemetry*.

Sobrevivencia, movimientos y uso de hábitat de *Falco femoralis* liberados en el sur de Texas

RESUMEN.—*Falco femoralis* se reproduce en Texas, New Mexico y Arizona. La nidificación en los Estados Unidos fue documentada por última vez en 1952. En 1986, *F. femoralis* fue categorizado como "en peligro"; los esfuerzos por reestablecerlo en sus áreas de reproducción comenzaron por liberación de individuos, criados cautivamente, en el sur de Texas. Desde 1993–94, 38 halcones de un año fueron liberados en Laguna Atascosa National Wildlife Refuge. Dos a tres semanas despues de la liberación, 28 halcones fueron recapturados para montarles un radio-transmisor. Nosotros reportamos sobrevivencia, movimientos y uso de hábitat de estas aves. En 1993, cuatro muertes conocidas ocurrieron a dos semanas de la liberación. En 1994, 5 muertes conocidas ocurrieron durante las cuatro primeras semanas luego de su liberación. De dos a seis meses post-liberación, 11 machos y tres hembras radio-marcadas usaron un ámbito de hogar de alrededor de 73.9 km^2 (rango 36–281 km^2). La mayoría de los movimientos no se extendía más allá de 10 km del borde del refugio, excepto un macho que se dispersó 136 km al norte, luego de 70 d. El promedio de distancias lineares de movimiento diario fue de 34 (SD = 5) km.

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Luego de 75 días de liberados los halcones, ellos en forma consistente usaron áreas específicas para forrajear y descansar. La densidad promedio de plantas leñosas fue de 2.6 plantas/ha en áreas de forrajeo y de 3.6 plantas/ha en sitios de descanso. La cobertura vegetal fue de un 60% en áreas de forrajeo y de un 46% en sitios de descanso.

[Traducción de Ivan Lazo]

The distribution of the aplomado falcon (*Falco femoralis*) in the U.S. formerly extended from southern Arizona and New Mexico to westcentral and southern Texas (Sprunt 1955, AOU 1983). Specimen records and documented sightings indicate they were fairly common throughout their range until about 1940 but rarely seen thereafter (Hector 1987). Nesting in the U.S. was last documented in 1952 near Deming, New Mexico (Ligon 1961). Reasons for the decline of the aplomado falcon are unknown, but habitat alteration by encroachment of woody brush species in former grasslands, and later widespread use of hydrocarbon pesticides such as DDT, appear to have been major contributors of the decline (Hector 1987). Severe pesticide contamination in eastern Mexico and evidence of population declines in northern Mexico (Kiff et al. 1980) led to the species being listed as endangered in 1986 (Shull 1986).

Failure of aplomado falcons to recolonize their former range prompted the U.S. Fish and Wildlife Service (USFWS) to implement the reintroduction phase of the Aplomado Falcon Recovery Plan in southern Texas (U.S. Fish and Wildlife Service 1990). This region was chosen as most suitable for releases, because it appears to have been the area where aplomado falcons last occurred in high breeding densities in the U.S.(Hector 1987, 1990) and because it is near remnant populations in Mexico.

From 1986–89, Peregrine Fund, Inc. personnel released 22 aplomado falcons on or in the vicinity of Laguna Atascosa National Wildlife Refuge (LANWR; Cade et al. 1991). Outcomes of these releases are unknown because birds were not monitored beyond 2 mo post-release. Herein, we report the survival, movements, and habitat use of aplomado falcons released in 1993 and 1994.

STUDY AREA AND METHODS

LANWR is an 18 268 ha Gulf of Mexico coastal refuge located about 32 km north of Brownsville, Texas. The refuge was established in 1946, primarily for the protection of wintering waterfowl. Management priorities now include protection of endangered species. The refuge slopes toward the Laguna Madre about 27 cm/km. Elevations of 6–10 m occur on natural clay/sand ridges, but the majority of the refuge is <2 m above sea level. The landscape consists of an irregular pattern of meandering oxbow lakes, brushy clay ridges, coastal salt/tidal flats, and impoundments (USFWS unpubl. rep.).

Natural vegetation on the refuge is a complex mixture of temperate, semiarid, tropical, and seashore species whose distribution is primarily determined by elevation. Six general vegetative types occur on the refuge: marshy wetland (8296 ha), coastal prairie (5666 ha), thorn scrub (3237 ha), savannah (202 ha), grassland (445 ha), and cropland (421 ha) (USFWS unpubl. rep.).

Monitored aplomado falcons were captive-bred and raised at the Peregrine Fund, Inc., Boise, Idaho. When about 4 wk of age, young falcons were transported to LANWR. Release boxes were opened and fledglings were released when about 37 d old. Food was provided at the release site until released falcons no longer returned to feed.

Two to 3 wk following release, 21 of 26 falcons released in 1993, and seven of 12 released in 1994 were recaptured for attachment of tail-mounted radiotransmitters. Transmitters weighing 4 g with a battery life of 4–6 mo were attached to males and some females, while radios weighing 5 g and lasting 11 mo were used only on female falcons. Reception distances were ≤1.6 km on ground and 6–10 km from aircraft. Telemetric monitoring was primarily accomplished from the ground, but aerial searches were conducted when ground efforts failed to locate falcons for at least 3 d.

Locations were derived from a minimum of two bearings using the strongest signal method as described by Springer (1979). Locations estimated from radio bearings and sightings were used to construct minimum convex polygons (Jennrich and Turner 1969). Range size was estimated using the Microcomputer Program for Analysis of Animal Locations (Stüwe and Blohowiak 1985).

We used the point-centered quarter method (Cottam and Curtis 1956) to describe woody vegetation structure and density, and a modified version of the step-point method (Evans and Love 1957) to estimate ground cover and botanical composition on foraging areas and roosting sites used by released falcons. Areas were categorized as foraging areas if we observed recurrent foraging by ≥1 falcons for >2 wk. Roost sites were defined as areas where ≥1 falcons roosted ≥3 times.

Woody vegetation was sampled at seven forage areas and two roost sites. Five forage areas and the two roost sites were on LANWR; the remaining two forage areas were within 2 km of the western and southern boundaries of the refuge. Woody vegetation transects were centered on frequently used perch or roost sites. From this center point, three linear transects were established that radiated outward 300 m. Initial transects were selected randomly and each succeeding transect was placed 120° on either side of the initial transect. Sampling points were at the site center, 100 m, and 200 m. Four 90° sam-

Table 1. Sex, date released, number of locations, range size and number of days monitored for radio-tagged aplomado falcons released on Laguna Atascosa National Wildlife Refuge during 1933 and 1994.[a]

SEX	DATE RELEASED	NUMBER OF LOCATIONS	RANGE SIZE (km^2)[b]	DAYS MONITORED
M	1 Aug 93	18	49.6	83
F	13 Jun 93	23	215.5	149
M	13 Jun 93	31	59.3	173
M	7 Jul 93	13	79.6	132
M	7 Jul 93	11	67.1	103
M	14 Jul 93	19	164.8	86
F	2 Jul 93	10	35.7	112
M	11 Jul 93	24	78.1	89
M	11 Jul 93	12	64.8	66
M	1 Aug 93	11	86.5	42
M	25 Jul 93	18	46.2	100
M	25 Jul 93	11	55.8	286
F	19 Jul 94	34	277.2	59
M	15 Jun 94	28	281.2	61

[a] Individuals monitored for a ≥2 mon and ≥10 telemetric and/or visual locations.

[b] Ranges derived from minimum convex polygons.

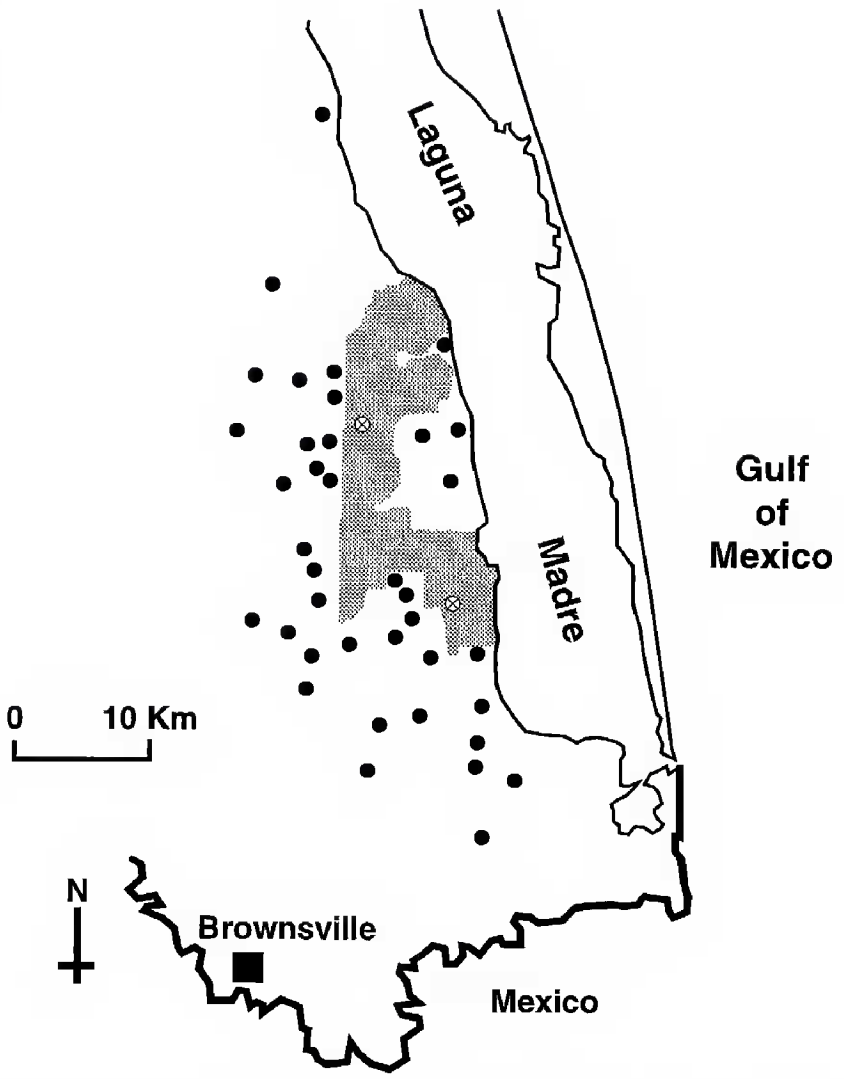

Figure 1. Locations of 28 aplomado falcons recorded 6 mo following releases in 1993 and 1994 at Laguna Atascosa National Wildlife Refuge, Texas. Release sites are marked within the refuge boundary.

pling quadrants were established at each sampling point with the transect line and a line perpendicular to the transect forming the borders of the quadrant. Woody plants ≥0.5 m tall nearest the sampling point in each quadrant were selected. From these plants, sampling point-to-plant distance, total height, crown width at narrowest and widest points, and species were recorded. Density of woody vegetation was determined following formulas in Bonham (1989).

The same transects established for the quarter method were used for step-point sampling. Sampling points were approximately 1 m paces along transects. Any plant touching the boot or within 1 cm in front of the boot was considered a hit for recording plant species, otherwise bare ground, bare ground with standing water, plant litter or plant litter with standing water was recorded.

Chi-square tests were used to test for intrasite and intersite variability in vegetation. Habitat tabulation and statistical testing were done using SAS (SAS Institute, Inc. 1987). Means are accompanied by standard errors and statistical significance was at $\alpha = 0.05$.

RESULTS

Survival. Within 2 wk of release in 1993, we found remains of four falcons. No other mortalities were documented in 1993, giving a minimum of 15% mortality for the first year. In 1994, five known mortalities occurred during the first 4 wk post-release giving a minimum mortality rate of 42%. Five falcons that roosted on exposed, elevated perches were suspected of being preyed on by great horned owls (*Bubo virginianus*). Three falcons that consistently roosted on open ground were probably preyed on by coyotes (*Canis latrans*). A Harris' hawk (*Parabuteo unicinctus*) captured one falcon. Ten of the released falcons could not be located 3 mo post-release and the status of these individuals was unknown. The period from release to last known location for these 10 averaged 53.5 ± 6.1 d.

Movements. We recorded 10–34 telemetric or visual locations on 14 falcons (11 males, 3 females) that were monitored 42–286 days (Table 1). Locations resulted from aerial searches as far as 300 km north, 80 km inland, and 27 km south of the refuge. The average number of locations for each falcon was 19 ± 2. Range sizes averaged 112 ± 23 km^2 with ranges of males averaging 94 ± 21 km^2 and those of females averaging 176 ± 72 km^2. Total area used was 739 km^2, and included land on and in the vicinity of LANWR (Fig. 1). Number of locations and range size were correlated ($r = 0.66$, df = 1, $P < 0.05$).

Table 2. Measurements (m) of woody vegetation in foraging and roost sites of aplomado falcons released on LANWR in 1993 and 1994.

Site Type	Confidence Interval for Mean Density (95%)	Woody Plant Density[a]	Mean Point to Plant Distance	Confidence Interval for Mean Distance (95%)	Plant Height $\bar{x} \pm$ SE	Crown	
						Length $\bar{x} \pm$ SE	Width $\bar{x} \pm$ SE
F[b]	0.3–1.6	0.6	130.6	79.6–181.6	1.2 ± 0.1	1.3 ± 0.1	1.4 ± 0.1
F	0.3–0.9	0.5	144.8	105.2–184.3	1.6 ± 0.2	1.5 ± 0.3	1.6 ± 0.3
F	31.2–244.1	67.8	12.1	6.4–17.9	0.8 ± 0.1	0.6 ± 0.1	0.8 ± 0.1
F	3.2–17.8	6.3	39.7	23.7–55.8	0.9 ± 0.2	1.3 ± 0.2	1.3 ± 0.2
F	1.7–6.9	3.1	57.0	38.0–76.1	1.2 ± 0.1	1.1 ± 0.1	1.1 ± 0.1
F	28.9–918.3	83.8	10.9	3.3–18.6	0.8 ± 0.0	1.0 ± 0.1	1.2 ± 0.1
F	4.21–33.8	9.2	33.0	17.2–48.7	0.8 ± 0.0	0.6 ± 0.1	0.7 ± 0.1
R	6.7–55.7	14.9	25.9	13.4–38.5	1.6 ± 0.1	1.7 ± 0.3	1.6 ± 0.2
R	0.7–5.3	1.6	79.7	43.3–116.1	1.5 ± 0.1	1.2 ± 0.1	1.4 ± 0.1

[a] Plants/ha.
[b] F = forage; R = roost.

For the first few weeks after release, falcons stayed close to their release towers. By 35 d post-release, falcons at a release site in 1993 began traveling to the other release site 15 km away. By 68 d post-release, at least seven falcons had travelled between the two release sites. In 1994, only two females (73 and 91 days of age) moved between the release sites. Approximately 2.5 mo post-release, falcons began ranging to several kilometers from the refuge boundary. One 70-d-old male falcon was observed 136 km north of LANWR after roosting on the refuge 2 d earlier. A second male flew 14 km west of the refuge in an apparent dispersal when 70 d old, but returned to the refuge frequently. Most outbound movements from LANWR were <10 km for 2–6 mo post-release (Fig. 1).

Mean daily linear travel distances from roost to roost for monitored birds was 34 ± 5 km. From first light, one male falcon was tracked for 55 km to its evening roost, but we do not know if it had roosted there the previous night.

Habitat Use. Approximately 75 d post-release, falcons (N = 23) began consistently using specific areas to forage and roost. All sampled roost sites were within 2 km of foraging areas, and consistently in honey mesquite (*Prosopis glandulosa*) stands on edges of open, usually grassy areas. Most foraging areas contained small honey mesquites and trecul yuccas (*Yucca treculeana*) on higher elevations overlooking saltflats or wet marshy areas in depressions known locally as "charcos." Less often used foraging sites were cattle-grazed pastures, characterized by low grasses (<60 cm), scattered prickly-pear (*Opuntia lindheimeri*), and live and dead honey mesquite trees. Infrequently used foraging areas were bare ground and fallow agricultural fields in the vicinity of LANWR. Most fallow or plowed fields were typically surrounded by grassy areas. In these open environments, falcons landed on the ground or used posts or honey mesquites as perches.

The mean overall point-to-plant distance in foraging areas was 61.4 ± 20.7 m resulting in a density of 2.6 woody plants/ha (Table 2). Plants in foraging areas had a mean height of 1.1 ± 0.1 m and mean crown dimensions of 1.1 ± 0.1 by 1.2 ± 0.1 m. Overall point-to-plant distances for roost sites averaged 52.8 ± 22.4 m or 3.6 woody plants/ha (Table 2). Plants at roost sites had a mean height of 1.5 ± 0.1 m and mean crown dimensions of 1.4 ± 0.1 by 1.5 ± 0.1 m.

In foraging areas, honey mesquite, sea oxeye (*Borrichia frutescens*), and prickly-pear comprised 83% of the total sampled woody plant vegetation (Table 3). Overall heights of woody plants in foraging areas ranged from 0.5–5.0 m. In roost sites, honey mesquite, huisache (*Acacia smallii*), and trecul yucca comprised 89% of the total sampled woody plant vegetation (Table 3). Overall heights of woody vegetation in roost sites ranged from 0.8–3.4 m. Honey mesquite, which was the most abundant woody species on both site types, averaged 1.4 ± 0.1 m tall in forage areas and 1.6 ± 0.2 m tall in roost sites. Second and third most abundant woody plant species averaged from 0.7–0.9 m taller in roost sites than in foraging areas.

Table 3. Relative frequency and heights of most abundant woody plants in foraging and roost sites of aplomado falcons released on Laguna Atascosa National Wildlife Refuge in 1993 and 1994.

SITE TYPE[a]	SPECIES	RELATIVE FREQUENCY (%)	HEIGHT $\bar{x} \pm$ SE (m)	RANGE (m)
F	*Prosopis glandulosa*	38.5	1.4 ± 0.1	0.5–5.0
F	*Borrichia frutescens*	31.8	0.6 ± 0.0	0.5–1.0
F	*Opuntia lindheimeri*	12.5	0.8 ± 0.0	0.5–1.4
R	*Prosopis glandulosa*	44.6	1.6 ± 0.2	0.8–3.4
R	*Acacia smallii*	26.8	1.5 ± 0.1	1.0–2.5
R	*Yucca treculeana*	17.9	1.5 ± 0.2	1.0–2.6

[a] F = forage, R = roost.

Foraging sites averaged 60.2 ± 5% vegetated and 39.8 ± 5% nonvegetated (Table 4). We identified 48 (range = 7–26) species of woody plants, shrubs, halophytes, and grasses on forage areas (Perez 1995). Five species made up 46.7% of the plants. Plant cover on forage areas ranged from 42.0–75.7%, while wet and dry bare ground ranged from 14.9–43.3%, and wet and dry plant litter ranged from 2.4–41.8%.

Roost sites averaged 46 ± 9% vegetated and 54 ± 9% nonvegetated surface area (Table 4). We identified 20 (range = 15–17) species on roost sites (Perez 1995). Four species comprised 39.3% of the vegetation in roost sites. Plant cover in roost sites ranged from 37.0–55.1%, while wet and dry bare ground ranged from 4.5–58.5% and wet and dry plant litter ranged from 22.0–58.5%. Variability of nonvegetated surface area differed among forage areas ($\chi^2 = 410.91$, df = 6, $P < 0.05$) and among roost sites ($\chi 2 = 60.15$, df = 1, $P < 0.05$). Variability between both site types also differed significantly ($\chi^2 = 115.58$, df = 1, $P < 0.05$).

DISCUSSION

Survival. We recorded a 24% mortality rate for released hatch-year aplomado falcons at LANWR during the first 4 wk post-release. All but one of the deaths appeared to occur during hours of darkness. During the first few weeks after release, some young falcons were seen roosting on the ground or conspicuously on the tops of the release towers or fence posts where they probably became easy prey for great horned owls and coyotes. Great horned owl predation is the greatest known cause

Table 4. Ground cover on forage areas and roost sites used by aplomado falcons released on Laguna Atascosa National Wildlife Refuge in 1993 and 1994.

FORAGE AREAS	COVER (%)	ROOST SITES	COVER (%)
Vegetated		Vegetated	
Monanthochole littoralis	27.0	*Spartina spartinae*	20.4
Sporobolus virginicus	7.2	*Monanthochole littoralis*	11.2
Dichanthium aristatum	5.8	*Prosopis glandulosa*	5.1
Batis maritima	5.1	*Salicornia virginica*	2.6
Chloris gayana	1.6	Other species[b]	6.7
Other species[a]	13.5		
Nonvegetated		Nonvegetated	
Bare ground	21.7	Bare ground	13.6
Plant litter	12.6	Plant litter	40.2
Bare ground with water	5.3	Bare ground with water	0.1
Plant litter with water	0.2	Plant litter with water	0.1

[a] Other species at <1% each ($N = 43$).
[b] Other species at <1% each ($N = 16$).

of post-fledgling mortality of peregrine falcons (*Falco peregrinus*) released in reintroduction programs in the eastern U.S. (Sherrod 1983). Sherrod (1983) also noted that released peregrine falcons do not have the benefit of parental defense, which would be expected to reduce young falcon deaths.

Movements. Hector (1990) predicted home range size for aplomado falcons to be 34 km^2/pair. Montoya (1995) monitored paired wild adult and subadult aplomado falcons in Chihuahua, Mexico, from February–August 1993, and found ranges of only <1–21 km^2. Our ranges of 36–281 km^2 were larger than predicted and were probably due to the fact that post-fledgling falcons have expanded territories before they establish pair bonds.

Daily linear movements of up to 55 km that we recorded showed the highly mobile behavior of young aplomado falcons. This high mobility and relatively short signal range of our transmitters made it difficult to account for the whereabouts of radio-tagged falcons. We frequently could not locate radio-tagged birds from the time they left roost sites in the morning until they returned that evening. As a result, actual home ranges were probably larger than recorded ranges.

There was great variability among individuals in dispersal distances. At least six aplomado falcons were still in the general vicinity of the refuge 6 mo after release and one remained near the release site for >1 yr post-release. Yet, other falcons dispersed 14–136 km.

Long range dispersals have been recorded previously for released aplomado falcons. A banded aplomado falcon was reported at Falfurrias, Texas, 140 km NW of LANWR (Lasley and Sexton 1992). This bird may have been released at LANWR, or may have been released in 1985 in Kleberg County, Texas, 15 km east of Falfurrias. A male released in 1989 at LANWR dispersed south to the port of Brownsville, about 22 km away (Peregrine Fund unpubl. rep.). Similar data for released peregrine falcons showed dispersal occurred at an average age of 76 d for males and 80 d for females (Sherrod 1983). Typical aplomado falcon movements were difficult to categorize as dispersal because permanent 1-way movements were rarely documented during the entire monitoring period. However, we may not have monitored enough released birds to effectively document dispersal, because only 37% of the falcons released during both seasons were monitored for >2 mo.

Age of dispersal may have been influenced in our study by release methodology. Food was provided at the release site until released falcons no longer returned to feed. Feeding may delay dispersal from the area, but is thought to be necessary until falcons become proficient hunters. Abundance of local food supplies was previously shown to delay the need to disperse; Johnson (1981) noted tundra nesting raptors gather in areas of high lemming (*Lemus lemus*) density, but rapidly disperse once prey populations decline. In addition, LANWR received 42 cm of rainfall above normal in 1993, which appeared to promote an eruption of dragonflies (Aeschnidae). We observed young aplomado falcons foraging almost exclusively on dragonflies while they were abundant. Such responses to prey abundance have been previously noted for white-tailed kites (*Elanus caeruleus*), ferruginous hawks (*Buteo regalis*), and rough-legged hawks (*Buteo lagopus*) (Johnson 1981).

Habitat Use. According to The Aplomado Falcon Recovery Plan (U.S. Fish and Wildlife Service 1990), suitable habitat contains inter-tree distances of from 15–45 m with a mean of 30 m and a woody plant density of 19 trees/40 ha or about 0.48 plants/ha. We found inter-plant spacing of woody vegetation to average 61 m in foraging areas and 53 m in roost sites, which exceeded the upper limit in the recovery plan. Hector (1986) reported inter-plant distances of 18–103 m on nesting territories in coastal Mexico, and Montoya (1995) recorded point-to-plant distances on nesting territories in desert grasslands of northern Chihuahua from 9–30 m. We found woody plant densities ranging from 0.5–83.8 plants/ha in foraging areas and 1.6–14.9 plants/ha in roost sites. Woody plant density on the Chihuahuan sites ranged from 11–140 plants/-ha with a mean of 77 plants/ha (Montoya 1995). This suggested that aplomado falcons use a broader range of woody plant density than previously thought or may be occupying suboptimal habitat.

Caution must be used in comparing woody plant densities across studies because the criteria for sampling differ according to individual site assessments, life stages, and geographic differences. For example, Hector (1981, 1986) included woody plants with a diameter at breast height >2 cm and log transformed his data to a form which assumed a more normal distribution. Our study and Montoya (1995) may be more comparable because methods and criteria were basically identical. However, life stages of falcons differed between Montoya's and our studies; Montoya studied a wild pop-

ulation of paired falcons, while we studied post-fledgling released falcons.

Plant cover in foraging and roosting areas was quite variable. Plant cover variation occurring within sites was usually due to intergradations of salt-flats and grasslands or wooded areas, resulting from subtle elevational differences along transects. In addition, these elevational changes resulted in different plant assemblages at each site. For example, gulf cordgrass, a species that often forms a transitional zone between wetland and upland areas (Lazarine 1988), was the most abundant plant in roosting areas, while foraging sites were dominated by keygrass (*Monanthochloe littoralis*), a species that is found only in tidal flats or salt marshes and attains a maximum height of 8–15 cm (Lonard 1993).

In foraging areas, 47% of the vegetation grew <80 cm tall and 22% of the ground surface was bare. The structural influences of ground level vegetation on habitat selection has been noted for many raptors (Janes 1985). Aplomado falcons tend to be perch foragers (Johnsgard 1990). According to Sprunt (1955), aplomado falcons generally use lower perches and often alight on the ground. We recorded many incidental feeding observations from perched positions on fence posts, yuccas, or on the ground. As the vegetation becomes taller and denser, perch foraging becomes less feasible (Janes 1985). Thiollay (1980) found that patches of short grass were strongly selected for by grassland raptors (including aplomado falcons) in eastern Mexico. He further hypothesized height of grass cover was an important factor in determining profitability of sit-and-wait (perch) feeding methods or hunting flight.

One goal of monitoring released aplomado falcons was to evaluate effectiveness of the release effort. Fourteen falcons survived for 2 mo and seven for ≥100 d. Most released falcons used more diverse habitats than predicted while staying on or near the refuge. Based on these results, we think the release program is showing evidence of success.

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